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(पहला पुनरीक्षण)

Indian Standard

PNEUMATIC SCREW DRIVERS AND NUT RUNNERS (NON-IMPACT TYPE) — SPECIFICATION

(*First Revision*)

UDC 621·883·7 — 85

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1994 **Price Group 2**

Pneumatic Tools Sectional Committee, PE 08

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Pneumatic Tools Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first issued in 1981. This revision has been taken up to bring it in line with latest technological developments and prevailing practices in the country.

Following are the major changes incorporated in this revision:

a) Driving end and tool bit shank hexagonal across flat size has been included.
b) Adjustable torque values have been provided.
c) Capacity has been extended up to M8 thread size.
d) Some important general requirements have been included.
e) Title is modified to distinguish it from impact type torque wrenches.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PNEUMATIC SCREW DRIVERS AND NUT RUNNERS (NON-IMPACT TYPE) — SPECIFICATION

(First Revision)

1 SCOPE

1.1 This Indian Standard covers general requirements for pneumatic screw drivers and nut runners suitable for light duty applications up to M8 screw, nut or bolt size.

1.2 This standard covers pneumatic screw drivers for machined screws only and not for application with wood screws, self tapping screws, etc.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
196 : 1966	Atmospheric conditions for testing (*revised*)
554 : 1985	Dimensions for pipe threads where pressure tight joints are required on threads (*third revision*)
8067 : 1986	Portable pneumatic impact wrenches (*first revision*)
8669 : 1992	Hexagon drive ends for power tools — Dimensions (*first revision*)
11609 : 1986	Technical supply conditions for pneumatic tools

3 TERMINOLOGY

3.1 Gauge Pressure

A steady pressure of compressed air measured on the gauge located within three metres from the inlet to the screw driver or nut runner.

3.2 Free Air Consumption

Volume of air corrected to standard atmospheric conditions of temperature and pressure according to IS 196 : 1966 consumed by the screw driver or nut runner without any fluctuations of pressure during the test.

3.3 Pneumatic Screw Driver

A pneumatic tool used for tightening or loosening a screw.

3.4 Pneumatic Nut Runner

A pneumatic tool used for tightening or loosening a nut or bolt.

4 TYPES

4.1 Based on direction of rotation:

a) Type NR — Non-reversible
b) Type R — Reversible

4.2 Based on design of handle (*see* Fig. 1):

a) Type PG — Pistol grip
b) Type L-ST — Lever and straight
c) Type L-RA — Lever and right angled

5 MATERIAL

Material shall be of uniform quality and shall be free from defects and imperfections that might affect the serviceability of the finished product.

6 DIMENSIONS AND PERFORMANCE CHARACTERISTICS

6.1 Dimensions and performance characteristics of screw drivers and nut runners shall be as given in Table 1.

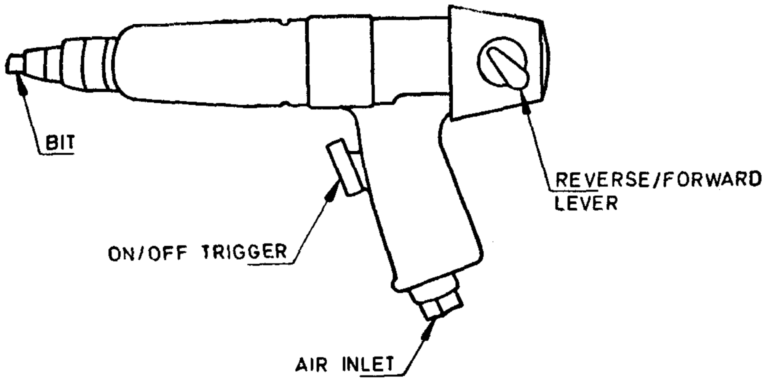
6.2 Tool Bit Shank

A typical male hexagon form with across flat size 6·3 mm to fit perfectly into female hexagon drive of the machine is given in Fig. 2.

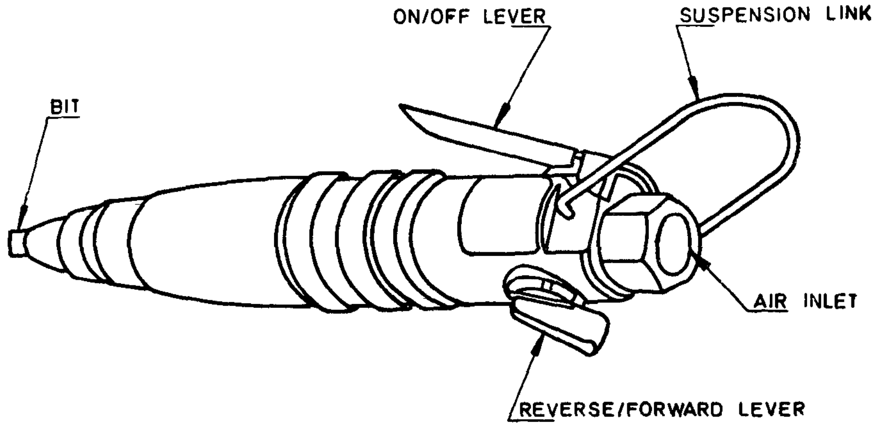
7 GENERAL REQUIREMENTS

7.1 Air Inlet Connection

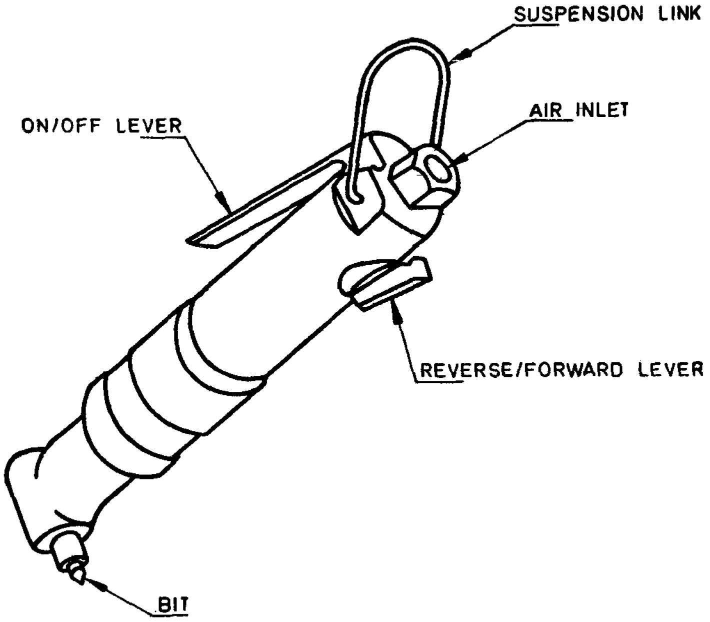
7.1.1 Air inlet connection shall be fitted with an air strainer or screen which shall be effective in retaining solid particles from compressed air supply. Moreover, it shall be possible to clean the strainer/screen easily.



TYPE PG- PISTOL GRIP

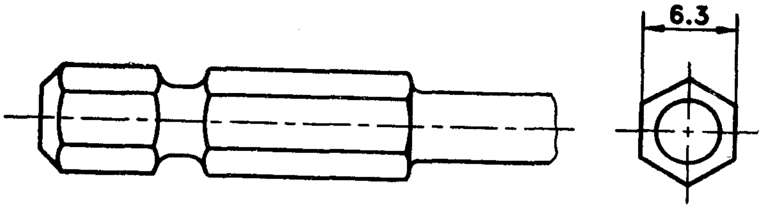


TYPE L-ST- LEVER AND STRAIGHT



TYPE L-RA- LEVER AND RIGHT ANGLED

FIG. 1 TYPES OF HANDLES FOR PNEUMATIC SCREW DRIVERS AND NUT RUNNERS



Dimension in millimetre.

FIG. 2 TOOL BIT SHANK

Table 1 Dimensions and Performance Characteristics

(*Clause* 6.1)

Nominal Size	**Capacity Thread Size**	**1)Hexagon Drive (mm)**	**Rated Torque**		**Air Consumption (m^3/min) (*Max*)**	**Mass (kg) ±10 Percent**	**Air Inlet Size**	**Inner Dia of Hose (mm)**
			Fixed Type (FD) (Nm) (*Min*)	Adjustable Type (AD) (Nm)				
4	M4	6·3	30	03-0	0·30	0·5	Rcl/4	6
5	M5		6·0	2·0-6·0	0·36	1·2		8
6	M6		10·0	4·0-10·0	0·45	1·2		
8	M8		14·0	8·0-14·0	0·55	1·7		

1)Female hexagon with form D according to IS 8669 : 1992.

7.1.2 Air inlet connection shall have pipe threads conforming to IS 554 : 1985.

7.1.3 The position of the air inlet connection shall not hinder working of tool when connected with air hose.

7.2 Throttle

7.2.1 Non-leakable, lever or push button type throttle shall be provided for admitting and shutting the supply of compressed air.

7.2.1.1 Design of the lever shall be such that an operator shall be able to operate the screw driver/nut runner easily with the fingers.

7.2.2 Non-leakable reversing throttle shall be provided for reversible tools. The mechanism shall operate smoothly in reversing the operation.

7.3 Suspension Link

7.3.1 It should have means of suspending the tool during operations.

7.4 Bearings

7.4.1 Bearings shall be suitably housed and adequately sealed to prevent leakage of lubricant and entrance of dirt and dust.

7.5 Spindle

7.5.1 The driving hexagon of the spindle shall be wear resistant. The driving hexagon, when fitted with a suitable tool bit shank, shall not show excessive run out which may adversely affect operation of the machine.

7.6 Drivers

7.6.1 The machine shall have either straight or angle drive. The machine with angle drive shall have axis of the drive shaft at 90° to the axis of the machine.

7.7 Operation

7.7.1 Machine shall not get excessive heated up when continuously operated for eight hours minimum.

7.7.2 No twisting thrust or kick back should be experienced by the operator during operation.

7.8 Lubrication

7.8.1 Arrangement shall be made to lubricate bearings, gears and other moving parts which are not lubricated from inline oil lubricator.

7.9 Requirements not covered in this standard, shall be as per IS 11609 : 1986.

8 TESTS

8.1 Air Consumption Tests

The water displacement meter or any other equally suitable instrument shall be used to determine the quantity of the air consumed per minute at 6±0·05 bar[1] pressure measured at a distance of not more than three metres from the tool. Air consumption corrected to standard atmospheric conditions of testing according to IS 196 : 1966 shall not exceed the values given in **6**.

8.2 Load Test

A screw driver/nut runner shall be tested for rated torque statimeter at an air pressure of 6±0·05 bar. The testing arrangement and testing procedure shall be according to **7.2** of IS 8067 : 1986.

8.2.1 The load test shall be carried out on one percent of the total ordered quantity, the minimum being one for an order of 50 or more. The load shall be applied on a screw driver under test after preliminary run of not less than 30 seconds.

8.3 Operational Tests

Every machine shall be tested for easy starting and stopping for at least 50 times (ON-OFF cycles) in each forward and reverse direction. It shall also be tested for easy fitment and removal of the tool bit shank on the hexagon drive. During testing, there shall be no abnormal noise or excessive temperature rise. The machine shall show no flaws developed during testing.

8.4 Endurance Test

8.4.1 *For Type Approval*

Each sample shall be put to field use for 100 hours of actual work. After field use the tool shall be dismantled and all parts examined. No part shall either break during field use or shall be found, cracked, deformed or show signs of excessive wear on examination.

8.4.1.1 After successful completion of this test, the total shall be subjected to air consumption and load test as per **8.1** and **8.2**. The results obtained shall conform to values specified in **6**.

8.4.1.2 The test as per **8.4.1** shall be carried out by the manufacturer before a new product is marketed or any changes are made in design or materials in the existing product. A type approval certificate shall be supplied by the manufacturer to the purchaser, if asked for.

8.4.2 *For Routine Testing*

One percent, the minimum being one of tools on order, if the order is for 50 pieces or more, shall be put to field use for 15 hours of actual work. After field use, the tool shall be dismantled and all parts shall be examined. No part shall either break during field use or be found broken, cracked, deformed or show signs of wear on examination.

9 DESIGNATION

9.1 A non-reversible type (NR) screw driver having adjustable torque (AD), nominal size 6 mm with lever and straight type handle (L – ST) and conforming to this standard shall be designated as:

PNEUMATIC SCREW DRIVER IS 9707
NR AD 6L – ST

9.2 A reversible type (R) nut runner havnig fixed torque (FD), nominal size 4 mm with pistol grip types handle (PG) and conforming to this standard shall be designated as:

PNEUMATIC NUT RUNNER IS 9707
R FD 4 PG

10 MARKING

The screw driver/nut runner shall be marked with designation, serial number, maximum working pressure and source of manufacture or trade-mark at a suitable location.

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[1] 1 bar = 1 kgf/cm^2 (approx).

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